A look into the future

Expected Maximum Fullcontainerships Size in South America 2011-2020

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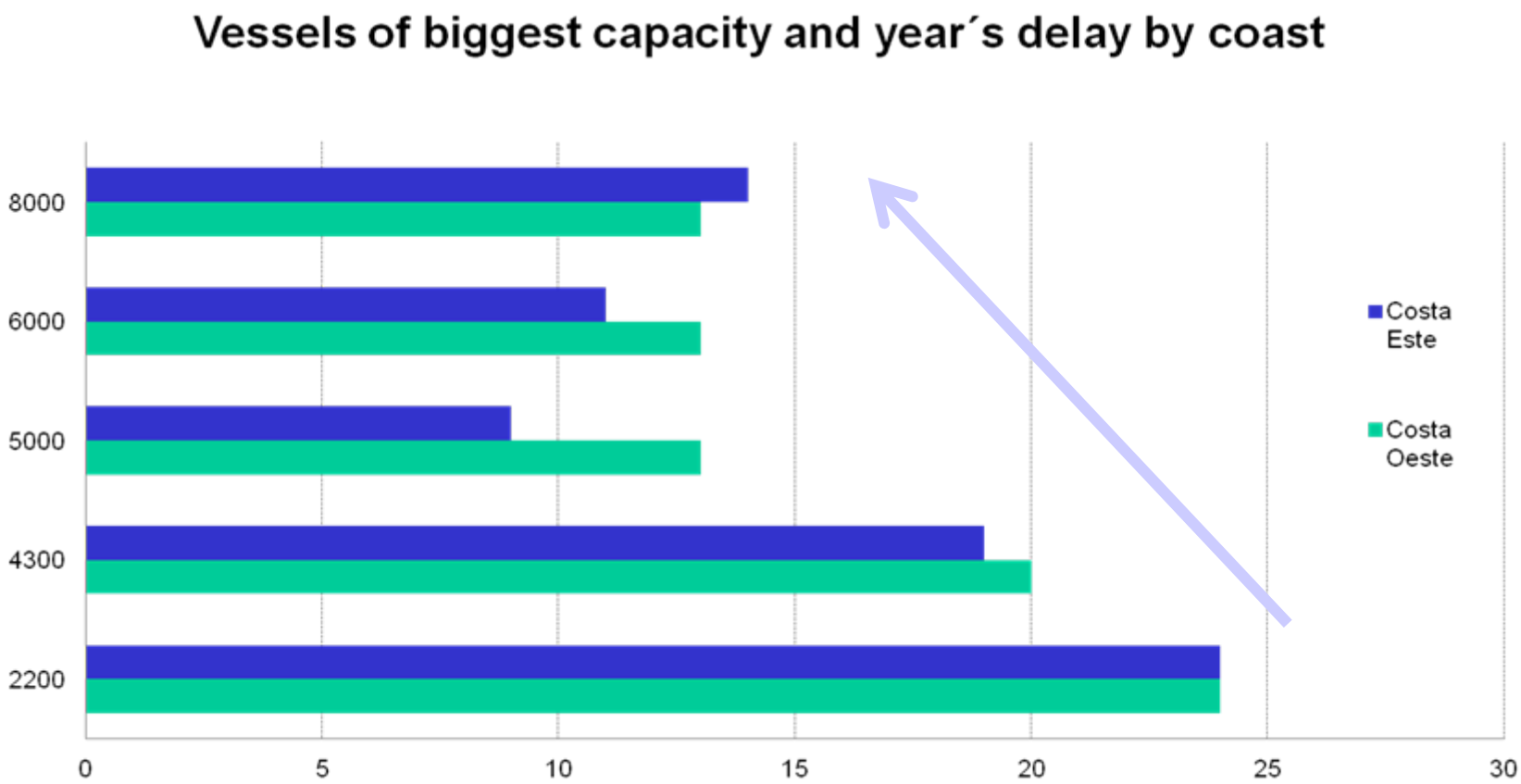
This delay for the arrival can be clearly seen in the figure below:



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The series presented in the previous slides are used as explanatory variables for determining when the current maximum size of ships will visit our coasts. The general estimated equation is as follows:

$$\text{Max\_Size}_{i,t} = \alpha_i + \beta_1 \cdot \text{D}_{i,t} + \beta_2 \cdot \text{Gap}_{i,t} + \beta_3 \cdot \text{Network}_{i,t} + \mu_{i,t}$$

Where:

"i" represents the specific route and "t" the year

Max_Size: is the maximum size of a vessel arrived on year "t" to destination "l" (West or East coast)

D: represents a variable that accounts for demand side (this variable was represented by three alternative measures: port activity, gdp and trade)

Gap: it's the difference between the max_size of the main trade routes and the coast "l" at the year "t"

Network: represents the complexity of networks

α: represents specific characteristics of coast "i"

We expect a direct relationship between the explanatory variables and the maximum size of the ships

Hypothesis: ships of ~ 13 000 TEUs arriving before 2020

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MODEL 1: $Max\_size_{i,t} = \alpha_i + \beta_{1,t} Max\_size_{i,t-1} + \beta_{2,t} Pa_{i,t} + \beta_{3,t} Gap_{i,t-3} + \mu_{i,t}$

Method: Pooled Least Squares
Fixed Effects
Observations #: 24x2
R^2: 0.93

Dependent Variable: MAX?
Method: Pooled Least Squares
Date: 06/21/11 Time: 23:20
Sample (adjusted): 1999 2010
Included observations: 12 after adjustments
Cross-sections included: 2
Total pool (balanced) observations: 24

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-337.3506	418.4550	-0.806181	0.4301
MAX?(-1)	0.471389	0.234464	2.010498	0.0588
PA?	364.0141	135.0310	2.695782	0.0143
GAP?(-3)	431.8734	177.8912	2.428615	0.0254
Fixed Effects (Cross)				
_SAE--C	-294.3351			
_SAW--C	294.3351			

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.930653	Mean dependent var	4170.750
Adjusted R-squared	0.916054	S.D. dependent var	1368.569
S.E. of regression	396.5223	Akaike info criterion	14.98639
Sum squared resid	2987369.	Schwarz criterion	15.23182
Log likelihood	-174.8367	Hannan-Quinn criter.	15.05151
F-statistic	63.74607	Durbin-Watson stat	1.831029
Prob(F-statistic)	0.000000		

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MODEL 2: $d(Max\_size_{west,t}) = \alpha_{west} + \beta_{1,t} Max\_size_{west,t-1} + \beta_{2,t} Pa_{west,t} + short\_term + \mu_{west,t}$

Method: Least Squares
Including error correction mechanism
Observations #: 22
R^2: 0.84

Dependent Variable: D(MAX_SAW)
Method: Least Squares
Date: 07/21/11 Time: 18:37
Sample (adjusted): 1989 2010
Included observations: 22 after adjustments

	Coefficient	Std. Error	t-Statistic	Prob.
C	782.8675	415.0728	1.886097	0.0837
MAX_SAW(-1)	-0.421373	0.201255	-2.093725	0.0582
PA_SAW(-1)	336.2705	100.2144	3.355510	0.0057
D(MAX_SAW(-2))	-1.227783	0.425118	-2.888098	0.0136
D(MAX_SAW(-4))	0.775653	0.403789	1.920935	0.0788
D(PA_SAW(-1))	-491.0165	245.7356	-1.998150	0.0689
D(PA_SAW(-4))	865.5532	367.6362	2.354375	0.0364
D(GAP_SAW(-1))	471.0198	238.3889	1.975846	0.0716
D(GAP_SAW(-2))	-980.5820	226.6530	-4.326358	0.0010
D(GAP_SAW(-3))	-1006.318	287.3030	-3.502636	0.0044

R-squared	0.840078	Mean dependent var	195.4091
Adjusted R-squared	0.720136	S.D. dependent var	394.3632
S.E. of regression	208.6267	Akaike info criterion	13.82192
Sum squared resid	522301.0	Schwarz criterion	14.31785
Log likelihood	-142.0412	Hannan-Quinn criter.	13.93875
F-statistic	7.004054	Durbin-Watson stat	2.073665
Prob(F-statistic)	0.001354	Second-Stage SSR	522301.0

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MODEL 3: $d(Max\_size_{east,t}) = \alpha_{east} + \beta_{1,t} Max\_size_{east,t-1} + \beta_{2,t} Pa_{east,t} + short\_term + \mu_{east,t}$

Dependent Variable: D(MAX_SAE)
Method: Least Squares
Date: 07/21/11 Time: 18:52
Sample (adjusted): 1989 2010
Included observations: 22 after adjustments

	Coefficient	Std. Error	t-Statistic	Prob.
C	542.4054	174.7375	3.104115	0.0091
MAX_SAE(-1)	-0.278258	0.084186	-3.305281	0.0063
PA_SAE(-1)	128.8958	37.51968	3.435418	0.0049
D(MAX_SAE(-2))	-0.306832	0.151160	-2.029850	0.0651
D(MAX_SAE(-3))	-1.194125	0.173124	-6.897506	0.0000
D(PA_SAE(-1))	-204.6523	86.47407	-2.366633	0.0356
D(PA_SAE(-4))	1291.823	168.0620	7.686584	0.0000
D(GAP_SAE(-1))	-474.5422	110.1457	-4.308314	0.0010
D(GAP_SAE(-3))	-1436.615	160.0021	-8.978724	0.0000
D(GAP_SAE(-4))	-914.6590	140.3819	-6.515504	0.0000

R-squared	0.932675	Mean dependent var	193.0000
Adjusted R-squared	0.882182	S.D. dependent var	365.4606
S.E. of regression	125.4432	Akaike info criterion	12.80454
Sum squared resid	188832.1	Schwarz criterion	13.30047
Log likelihood	-130.8499	Hannan-Quinn criter.	12.92136
F-statistic	18.47114	Durbin-Watson stat	2.229207
Prob(F-statistic)	0.000010	Second-Stage SSR	188832.1

Method: Least Squares
Including error correction mechanism
Observations #: 22
R^2: 0.93

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MODEL 4: $d(Max\_size_{i,t}) = \alpha_i + \beta_{1,t} Max\_size_{i,t-1} + \beta_{2,t} Pa_{i,t} + short\_term + \mu_{i,t}$

Method: Pooled Least Squares
Including error correction mechanism
Observations #: 22*2
R^2: 0.57

Dependent Variable: D(MAX?(-0))
Method: Pooled Least Squares
Date: 08/01/11 Time: 15:33
Sample (adjusted): 1989 2010
Included observations: 22 after adjustments
Cross-sections included: 2
Total pool (balanced) observations: 44
White period standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
MAX?(-1)	-0.127317	0.025488	-4.995249	0.0000
PA?(-1)	89.52544	19.28739	4.641656	0.0000
D(MAX?(-2))	-0.979974	0.007124	-137.5584	0.0000
D(PA?(-2))	395.0944	106.8406	3.697980	0.0007
D(PA?(-4))	522.6560	70.21460	7.443694	0.0000
D(GAP?(-2))	-723.2172	76.93960	-9.399804	0.0000
D(GAP?(-3))	-400.3576	105.3898	-3.798826	0.0006
_SAW--C	325.1898	14.98167	21.70585	0.0000
_SAE--C	101.5927	64.98768	1.563261	0.1270

R-squared	0.566974	Mean dependent var	194.2045
Adjusted R-squared	0.467996	S.D. dependent var	375.7418
S.E. of regression	274.0608	Akaike info criterion	14.24483
Sum squared resid	2628826.	Schwarz criterion	14.60977
Log likelihood	-304.3862	Hannan-Quinn criter.	14.38017
F-statistic	5.728311	Durbin-Watson stat	1.941287
Prob(F-statistic)	0.000111		

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RESULTS

Taking into account the estimated parameters in previous models, and assuming an increase in port activity of 10% for the east coast of South America and 12% for the west coast (where the difference is based on the recent dynamic growth), the leading vessels currently in the main routes (of ~ 13,000 TEUs) would reach the South American coast by the end of the current decade.

	East Cost	West Cost
Model 1	2018	2020
Model 2	-	2017
Model 3	2019	-
Model 4	2016	2017

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Complementarity

- Scale economic
- Density economic
- Cooperation in an environment of competition

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Thank You!

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